

***Medorippe tanabei*, a new species of Miocene dorippid crab  
(Crustacea: Decapoda: Brachyura) from the Katsuta Group,  
West Honshu, Japan**

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*Abstract.*—A new dorippid crab, *Medorippe tanabei*, is described from the early middle Miocene Katsuta Group in Okayama Prefecture, Honshu, southwest Japan. The occurrence of *M. tanabei* together with *Medorippe margaretha* (Lörenthey in Lörenthey & Beurlen), new combination, extends the geologic range for the genus back to the middle Miocene. The discovery of the species from the middle Miocene of Japan suggests that the geographic range of the genus early in its history was far greater than it is now. A list of all known fossil species in the world assigned to the subfamily Dorippinae MacLeay is included.

The middle Miocene decapod fauna from the Katsuta Group of southwestern Honshu, Japan was studied by Karasawa (1992, 1993, 1998) and Karasawa & Kishimoto (1996). The decapod fauna consists of 13 species in 13 genera and represents a shallow marine decapod association in the early middle Miocene of Japan (Karasawa 1999).

The purpose of this paper is to describe an additional new species of a dorippid from the Katsuta Group. The material was collected from Shinden, Katsuta City, Okayama Prefecture (35°3'5"N, 134°4'1"E) (Fig. 1). Muddy sandstone of the Yoshino Formation of the Katsuta Group is exposed at the locality (Karasawa 1992). Yoshimoto (1979) assigned the Group to Zones N. 8b–9 (earliest middle Miocene) of Blow's scale of planktonic foraminifera. Karasawa & Kishimoto (1996a) reported nine decapod species from the locality and recognized the decapod assemblage characterized by the predominance of *Callianassa nishikawai* Karasawa, 1993 and *Laurentiella imaizumii* Karasawa, 1993. The assemblage suggests a depositional environment within the intertidal to upper sublittoral zone on a muddy bottom (Karasawa & Kishimoto 1996a).

The specimen is housed in the Mizunami Fossil Museum, Yamanouchi, Akeyo, Mizunami, Gifu, Japan.

Systematics

Family Dorippidae MacLeay, 1838  
Subfamily Dorippinae MacLeay, 1838

*Remarks.*—The subfamily Dorippinae is thought to contain nine Recent genera (Holthuis & Manning 1990) and the Eocene *Titanodorippe* Blow & Manning, 1996. Although Glaessner (1969) placed two extinct genera, *Goniochele* Bell, 1858 and *Orithopsis* Carter, 1872 in the subfamily, both were moved to the Calappidae De Haan, 1833 by Wright & Collins (1972) an arrangement followed by Collins & Smith (1993). In their review of fossil records Holthuis & Manning (1990) included seven species in four genera (*Dorippe* Weber, 1795, *Heikea* Holthuis & Manning, 1990, *Medorippe* Manning & Holthuis, 1981, and *Paradorippe* Serène & Romimohtarto, 1969) within the subfamily. Their review overlooked the occurrence of *Dorippe astuta* Fabricius, 1793 (= *Dorippoides facchio* (Herbst, 1785)) from the Pliocene of Java, described by Van Straelen (1938). Addi-

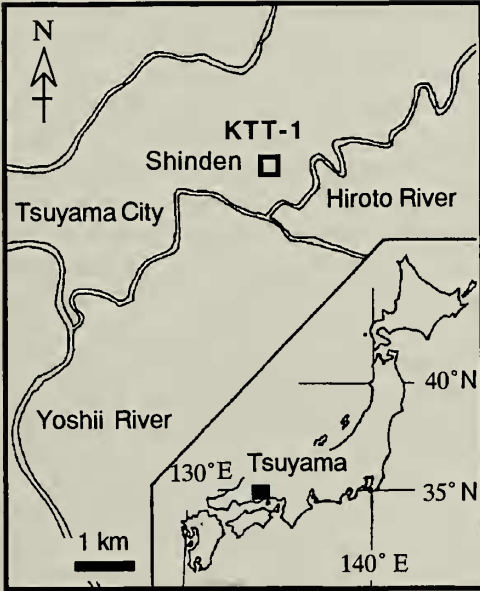


Fig. 1. Locality map.

tional fossil records include *Dorippe frascone tuberculata* Morris & Collins, 1991 from the Pliocene of Brunei, *Nobilum wenchii* Hu & Tao, 1996 from the Miocene of Taiwan, and *Paradorippe granulata* (De Haan, 1841) from the Pleistocene of Japan (Kato & Karasawa 1998).

Although Förster (1979) described *Dorippe? carpathica* Förster, 1979 from the Miocene of Poland, Müller (1996) provisionally placed this species in *Neodorippe*

Serène & Romimohtarto, 1969. Lörenthey in Lörenthey & Beurlen (1929) and Müller (1984) suggested that *Dorippe margaretha* Lörenthey in Lörenthey & Beurlen, 1929, from the Hungarian Miocene, has close affinities with the Recent *Medorippe lanata* (Linnaeus, 1767). The carapace in members of *Dorippe* is longer than wide with distinct dorsal tubercles, while in species of *Medorippe* it is wider than long with some low elevations dorsally. Therefore, *Dorippe margaretha* is here removed from *Dorippe* and placed in *Medorippe*; it differs from *M. lanata* by having obscure lateral branchial and dorsobranchial ridges. Thus 12 species in eight genera of dorippines, including a new species described below, are recognized (Table 1) as fossils.

Genus *Medorippe* Manning & Holthuis, 1981

*Type species.*—*Cancer lanatus* Linnaeus, 1767 by monotypy.

*Geologic range.*—Miocene–Recent.

*Medorippe tanabei*, new species

Fig. 2

*Material examined.*—MFM39019, holotype, carapace length 10.1 mm × carapace width 12.1 mm.

*Diagnosis.*—Carapace trapezoidal, wider

Table 1.—Distributions and geologic ranges of recognized fossil species of the subfamily Dorippinae MacLeay.

Species	Age	Locality
<i>Dorippe fankhauseri</i> Studer, 1892	Middle Miocene	Switzerland
<i>Dorippe frascone tuberculata</i> Morris & Collins, 1991	Pliocene	Brunei
<i>Dorippe quadridens</i> (Fabricius, 1793)	Holocene	Unknown
<i>Dorippoides facchio</i> (Herbst, 1785)	Pliocene	Java
<i>Heikea japonica</i> (Von Siebold, 1824)	Holocene	Japan
<i>Medorippe lanata</i> (Linnaeus, 1767)	Pleistocene	Italy
<i>Medorippe margaretha</i> (Lörenthey in Lörenthey & Beurlen, 1929)	Middle Miocene	Hungary, Portugal
<i>Medorippe tanabei</i> , new species	Middle Miocene	Japan
<i>Neodorippe? carpathica</i> (Förster, 1979)	Middle Miocene	Poland
<i>Nobilum wenchii</i> Hu & Tao, 1996	Miocene	Taiwan
<i>Paradorippe granulata</i> (De Haan, 1841)	Pleistocene–Holocene	Japan
<i>Titanodorippe eocenica</i> Blow & Manning, 1996	Upper Eocene	U.S.A.



Fig. 2. *Medorippe tanabei*, new species, MFM39019, holotype,  $\times 3.8$ , dorsal view of carapace.

than long. Front with 2 broadly triangular teeth. Inner orbital angle bluntly triangular. Lateral margin without granules and spines. Dorsal region well defined; protogastric and epibranchial regions with tubercle on each side; meso- and urogastric regions with median tubercle; cardiac region lacking V-shaped ridge, but bearing 3 tubercles; lateral branchial tubercle weakly developed; mesobranchial region with anterior dorso-branchial ridge and posterior dorsobranchial tubercle on each side.

*Description*.—Carapace (Fig. 2) small, trapezoidal in outline, length about 0.8 its width, widest a little posterior to midlength. Orbitofrontal margin occupying about 0.6 of carapace width. Front consisting of 2 broadly triangular teeth, separated by wide, sulcate, V-shaped emargination. Inner orbital angle bluntly triangular, separated from frontal tooth by shallow, rounded excavation. Upper orbital margin concave, with narrow, rather deep fissure. Outer orbital tooth distinct, but tip broken. Inner suborbital tooth visible in dorsal view, extending slightly beyond frontal tooth. Lateral margin strongly converging anteriorly, without granules and spines; margin anterior to cervical groove nearly straight, margin posterior to cervical groove strongly convex.

Dorsal carapace gently convex longitudinally, almost flat transversely, largely smooth. Dorsal region well defined. Each protogastric region with conical tubercle. Mesogastric region bearing bilobed median

tubercle posteriorly, with 2 oblique submedian pits connected with cervical groove. Urogastric region with small, conical tubercle. Cardiac region inflated, with 3 small, conical tubercles transversely arranged. Hepatic region nearly flat. Cervical and branchial grooves distinct. Epibranchial region with small, conical tubercle on each side. Branchial lobe elevated. Branchlocardiac groove deep, distinct. Meso- and metabranchial regions strongly inflated. Lateral branchial tubercle small, weakly developed. Each mesobranchial region with oblique dorsobranchial ridge and small, conical posterior dorsobranchial tubercle.

*Etymology*.—The specific name is dedicated to Mr. M. Tanabe who collected the type specimen.

*Remarks*.—*Medorippe tanabei*, new species, is assigned to *Medorippe* because the carapace is wider than long and it bears some small dorsal tubercles and lateral branchial tubercles. *Medorippe* is represented by a single Recent species, *Medorippe lanata* (see Holthuis & Manning 1990). The new species differs from *M. lanata* by having well separated frontal teeth and having small lateral branchial tubercles. *Medorippe tanabei* lacks the V- or Y shaped cardiac ridge and has low, conical projections on the dorsal surface of the front. Well defined protogastric, mesogastric, epibranchial and posterior dorsobranchial tubercles on the carapace readily distinguish the species from the Miocene *Medorippe margaretha* (Lörenthey in Lörenthey & Beurien, 1929). *Medorippe margaretha* has V-shaped cardiac and transverse urogastric ridges on the carapace which are lacking in *M. tanabei*. In *M. margaretha* the anterior dorsobranchial ridge on the mesogastric region is weakly developed.

The inclusion of *Medorippe tanabei* and *M. margaretha* in *Medorippe* extends the known geologic range of the genus to the middle Miocene. *Medorippe lanata* is now distributed in the Mediterranean Sea, tropical West Africa, southern Africa and Madagascar, and is recorded from the Pleisto-

cene of Italy (Holthuis & Manning 1990). *Medorippe margaretha* is known from the Miocene of Hungary and Portugal (Holthuis & Manning 1990). Recognition of *M. tanabei* from Japan greatly expands the known geographic range of the genus. The fossil records suggest that *Medorippe* had reached Japan and the Paratethys Sea by the middle Miocene.

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### Literature Cited

- Bell, T. 1858. A monograph of the fossil malacostracous Crustacea of Great Britain. Part 1, Crustacea from the London Clay. Palaeontographical Society (Monograph), London, 44 pp.
- Blow, W. C., & R. B. Manning. 1996. Preliminary descriptions of 25 new decapod crustaceans from the middle Eocene of the Carolinas, U.S.A.—*Tulane Studies in Geology and Paleontology* 29: 1–26.
- Carter, J. 1872. On *Orithopsis Bonneyi*, a new fossil crustacean.—*Geological Magazine* 9:529–532.
- Collins, J. S. H., & R. Smith. 1993. Ypresian (Lower Eocene) crabs (Decapoda, Crustacea) from Belgium.—*Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Sciences de la Terre* 63:261–270.
- de Haan, W. 1833–1850. Crustacea. In P. F. von Siebold, *Fauna Japonica sive Descriptio Animalium, quae in Itinere per Japoniam, Jussu et Auspiciis Superiorum, qui Summun in India Batava Imperium Tenent, Suscepit, Annis 1823–1830 Collegit, Notis, Observationibus et Adumbrationibus Illustravit, Ludguni-Batavorum* [Leiden], i–xvii, i–xxxii, ix–xvi, 1–243 pp., pls. A–J, L–Q, 1–55.
- Fabricius, J. C. 1793. *Entomologia Systematica Emendata et Aucta, Secundum Classes, Ordines, Genera, Species, Adjectis Synonymis, Locis, Observationibus, Descriptionibus*. Hafniae, 2: viii+519 pp.
- Förster, R. 1979. Decapod crustaceans from the Middle Miocene (Badenian) deposits of southern Poland.—*Acta Geologica Polonica* 29:89–106.
- Glaessner, M. F. 1969. Decapoda. Pp. R399–R533, R626–R628 in R. C. Moore, ed., *Treatise on Invertebrate Paleontology, Part R, Arthropoda* 4, vol. 2, Geological Society of America and University of Kansas Press.
- Herbst, J. F. W. 1782–1804. *Versuch einer Naturgeschichte der Krabben und Krebse, nebst einer systematischen Beschreibung ihrer verschiedenen Arten*. Berlin and Stralsund, 1–3:515 pp., 62 pls.
- Holthuis, L. B., & R. B. Manning. 1990. Crabs of the subfamily Dorippinae MacLeay, 1838, from the Indo-West Pacific region (Crustacea: Decapoda: Dorippidae).—*Researches on Crustacea, Special Number* 3:151 pp.
- Hu, C.-H., & H.-S. Tao. 1996. Crustacean fossils of Taiwan. Taipei, Taiwan, 228 pp.
- Karasawa, H. 1992. The crab *Ozius collinsi* sp. nov. (Xanthoidea: Decapoda: Crustacea) from the Miocene Katsuta Group, southwest Japan.—*Tertiary Research* 14:9–24.
- . 1993. Cenozoic decapod Crustacea from southwest Japan.—*Bulletin of the Mizunami Fossil Museum* 20:1–92.
- . 1998. *Typilobus kishimotoi*, a new leucosiid crab (Crustacea: Decapoda: Brachyura) from the Miocene Katsuta Group, Japan.—*Proceedings of the Biological Society of Washington* 111:97–101.
- . 1999. The Cenozoic decapod crustacean fauna of southwest Japan. Pp. 29–44 in F. R. Schram & J. C. von Vaupel Klein, eds., *Crustaceans and the Biodiversity Crisis. Proceedings of the Fourth International Crustacean Congress, Amsterdam, The Netherlands, July 20–24, 1998, vol. I, Leiden, 1021 pp.*
- , & S. Kishimoto. 1996a. Decapod crustaceans from the Katsuta Group (middle Miocene) of Okayama Prefecture, Japan.—*Bulletin of the Mizunami Fossil Museum* 23:39–50.
- , & ———. 1996b. Two new species of decapod crustaceans from the middle Miocene Katsuta Group, Japan.—*Bulletin of the Mizunami Fossil Museum* 23:35–37.
- Kato, H., & H. Karasawa. 1998. Pleistocene fossil decapod Crustacea from the Boso Peninsula, Japan.—*Natural History Research, Special Issue* 5:1–31.
- Linnaeus, C. 1767. *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Edition 12, Holmiae, 1 (part 2):533–1327.
- Lörenthey, E., & K. Beurlen. 1929. Die Fossilen Decapoden der Länder der ungarischen Krone.—*Geologica Hungarica, Series Palaeontologica* 3: 420 pp.
- MacLeay, W. S. 1838. On the brachyurous decapod Crustacea brought from the Cape by Dr. Smith.

- Pp. 53–71 in *Illustrations of the Annulosa of South Africa; being a Portion of the Objects of Natural History Chiefly Collected during an Expedition into the Interior of South Africa, under the Direction of Dr. Andrew Smith, In the Years 1834, 1835, and 1836; Fitted out by "The Cape of Good Hope Association for Exploring Central Africa"*, London.
- Manning, R. B., & L. B. Holthuis. 1981. West African Brachyuran crabs.—*Smithsonian Contributions to Zoology* 306:379 pp.
- Morris, S. F., & J. S. H. Collins. 1991. Neogene crabs from Brunei, Sabah and Sarawak.—*Bulletin of the British Museum (Natural History) (Geology)* 47:1–33.
- Müller, P. 1984. Decapod Crustacea from the Badenian.—*Geologica Hungarica, Series Palaeontologica* 42:317 pp.
- . 1996. Miocene decapod Crustacea from southern Poland.—*Prace Muzeum Ziemi, Prace paleozoologiczne* 43:3–14.
- Serène, R., & K. Romimohtarto. 1969. Observations on the species of *Dorippe* from the Indo-Malayan Region.—*Marine Research in Indonesia* 9:1–35.
- Studer, T. 1892. Ueber zwei fossile dekapode Krebse aus den Molasseablagerungen des Belpberges.—*Abhandlungen der Schweizerischen paläontologischen Gesellschaft* 19:1–8.
- Van Straelen, V. 1938. Crustaces decapodes Cenozoïques des Indes Orientales Néerlandaises.—*Leidsche Geologische Mededeelingen* 10:90–103.
- Von Siebold, Ph. F. 1824. De historiae naturalis in Japonica statu, nec non de augmento emolumentisque in seorsu perscrutatioem exspectandis Dissertatio, cui accedunt Spicilegia Faunae Japonicae. Würzburg, 20 pp.
- Weber, F. 1795. Nomenclator entomologicus secundum Entomologiam Systematicam ill. Fabricii adjectis speciebus recens detectis et varietatibus. Kiel and Hamburg, 171 pp.
- Wright, C. W., & J. S. H. Collins. 1972. British Cretaceous crabs.—*Monograph of the Palaeontographical Society of London* 126:1–114, 22 pls.
- Yoshimoto, Y. 1979. Tsuyama basin, Okayama Prefecture. Pp. 113–114 *In* R. Tsuchi, ed., *Fundamental data on Japanese Neogene Bio- and Chronostratigraphy*. Shizuoka University, 156 pp.